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Services Acquisition in the DoD:

A Comparison of Management Practices in the Army, Navy, and Air Force

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This article presents the results of empirical studies of current practices in services acquisition in the Army, Navy, and Air Force. The authors studied the management practices in areas such as contract characteristics, acquisition management methods, use of the project management approach, acquisition leadership, and ownership of requirements. They also studied areas such as the ability of personnel responsible for acquisition, adequacy of acquisition billets and their fill rates, and training provided to services acquisition personnel. The data confirmed that the Navy uses a regional contracting approach, while the Army and the Air Force use an installation-level approach. These differences have important implications for other acquisition management practices, such as the use of project management and contractor surveillance.

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14. ABSTRACT

This article presents the results of empirical studies of current practices in services acquisition in the Army,Navy, and Air Force. The authors studied the management practices in areas such as contract characteristics,acquisition management methods, use of the project management approach, acquisition leadership, and ownership of requirements. They also studied areas such as the ability of personnel responsible for acquisition,adequacy of acquisition billets and their fill rates, and training provided to services acquisition personnel. The data confirmed that the Navy uses a regional contracting approach, while the Army and the Air Force use an installation-level approach. These differences have important implications for other acquisition management practices, such as the use of project management and contractor surveillance.

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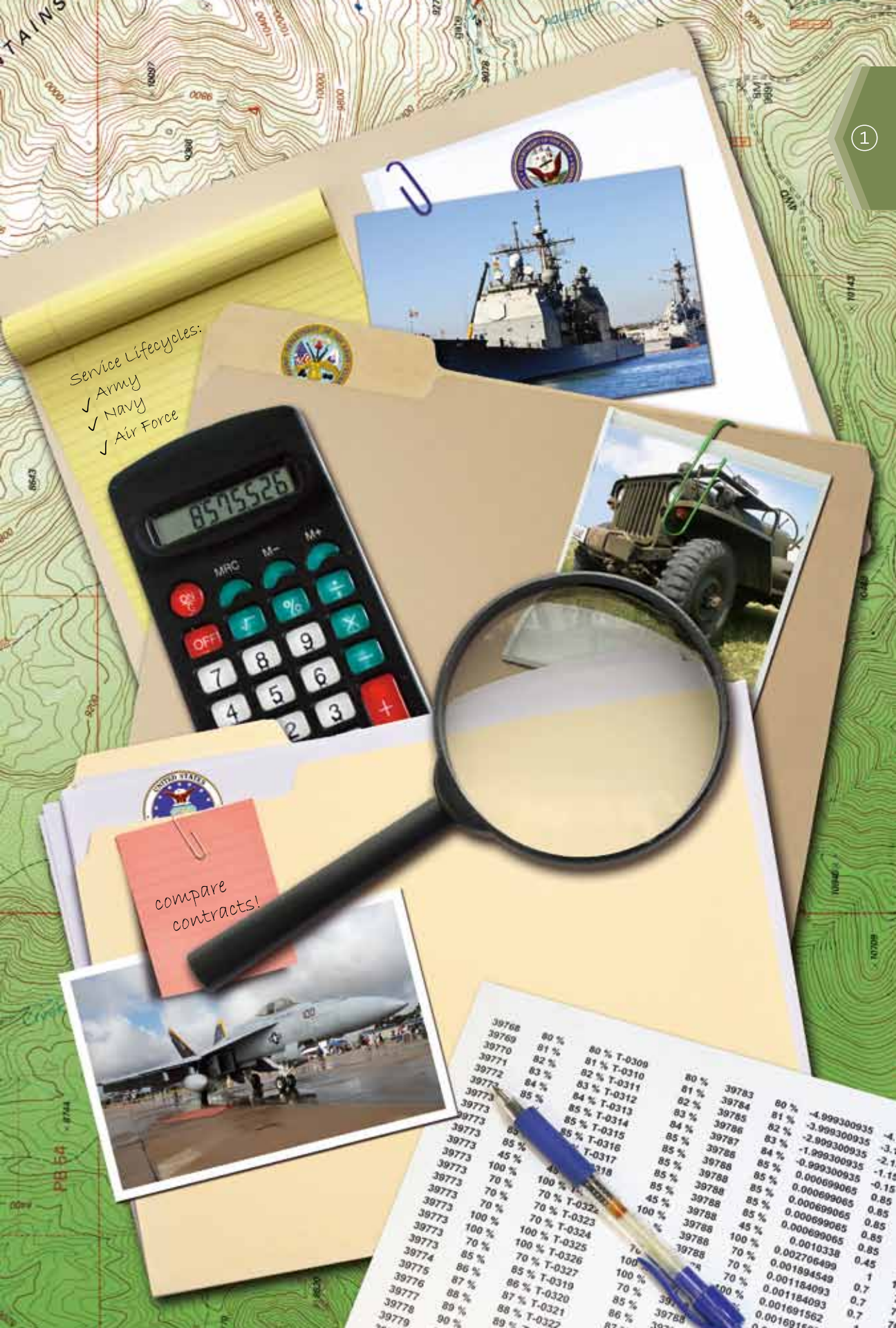
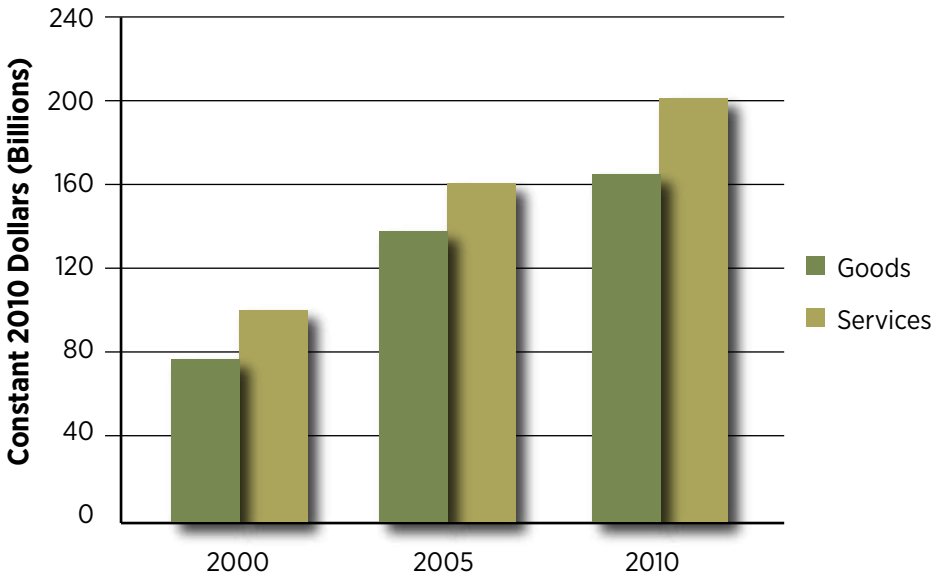

Service Lifecycles:
✓ Army
✓ Navy
✓ Air Force
compare contracts!

The service sector represents the largest and fastest growing segment of the economies of the United States and other developed countries. In the United States, services accounted for well over 85 percent of employment in the year 2007 (Apte, Nath, & Karmarkar, 2011). This growth of services in the overall economy has been mirrored by the growth of services acquisition in private-sector companies (Smeltzer & Ogden, 2002) and in the government. For example, as seen in Figure 1, the procurement of services in the DoD has continued to increase in scope and dollars in the past decade. Even considering the high value of weapon systems and military equipment purchased in recent years, the DoD has spent more on services than on supplies, equipment, and systems together (Camm, Blickstein, & Venzor, 2004). Specifically, the DoD obligations on contracts have more than doubled between fiscal years 2001 and 2008—to over $387 billion, with over $200 billion spent just for services (Government Accountability Office [GAO], 2009a).

FIGURE 1. DoD'S CONTRACTS FOR GOODS AND SERVICES (2000–2009)



Note. Adapted from "Defense Contract Trends: U.S. Department of Defense Contract Spending and Supporting Industrial Base," by J. R. Ellman, D. Liverood, D. Morrow, and G. Sanders, 2011. Center for Strategic & International Studies.

As the DoD's services procurement continues to increase in scope and dollars, the DoD must give greater attention to the management of services contracts. However, the increase in services contracting has coincided with a reduction in the Defense Acquisition Workforce. The Defense Acquisition Workforce fell from approximately 500,000 personnel in 1990, to approximately 200,000 personnel in 2006—a decrease of approximately 65 percent. For the U.S. Army, from 1995 to 2006 acquisition dollars increased by 382 percent, acquisition actions increased by 359 percent, yet the acquisition workforce decreased by 53 percent (Gansler, 2011, p. 237).

This mismatch between the increasing workload and the decreasing size of the workforce, and the unique nature and complexities associated with services acquisition, has possibly created an environment wherein following the best practices has not always been feasible. Between 2001 and 2009, the GAO issued 16 reports related to trends, challenges, and deficiencies in contracting for services. In addition, between 2002 and 2008 the DoD Inspector General (DoD IG) issued 142 reports on deficiencies noted in the DoD acquisition and contract administration process. A summary discussion of these deficiencies is provided in the Appendix.

The characteristics of service production differ from manufacturing production in several ways. The key differentiating characteristics of services discussed in textbooks (Fitzsimmons & Fitzsimmons, 2006; Metters, King-Metters, & Pullman, 2003) include the intangibility of service output, co-production, simultaneity of production and consumption, the inability to store services, and the complexity in the definition and measurement of services. The differences in the production of services as opposed to that of manufactured products give rise to an important question: Is the acquisition of services essentially the same as acquisition of products? If differences exist, then what are they, and what do they imply for the contracting of services? Given the growth in size and scope of services acquisition in today's economy, these questions are undoubtedly important.

This article analyzes and compares primary data collected by researchers from completed surveys involving the Departments of the Army, Navy, and Air Force; and draws conclusions on how services acquisition is managed within and across the departments. The analysis

of survey results will focus on the following areas: contract characteristics, acquisition management methods, project-team approach, services acquisition leadership, and other management issues.

The article is organized into four sections. In the next section, we describe the empirical studies we conducted, including the survey research methodology we used in the study. We provide the results of the survey data analysis and some salient observations in the third section. The findings and conclusions of the study and our recommendations for improving services acquisition and for future research are presented in the fourth section.

Research Methodology and the Empirical Studies

The methodology used in this research consisted of a survey instrument specifically developed to address the research objectives and questions mentioned in the Introduction section. This was a Web-based survey instrument developed using the SurveyMonkey™ software. The developed survey instrument (provided in Compton & Meinshausen, 2007) was first piloted for its validity and was fine-tuned prior to its use in this research.

The Web-based survey was conducted in all three military departments. The following discussion summarizes these survey-based empirical studies.

Army

The standardized survey was deployed to 81 contracting offices. The survey was distributed across 8 major contracting centers throughout the Army, including 40 Army installations. We received a total of 61 responses to the survey, with a survey response rate of 75 percent.

Navy

Since the Navy mostly follows a regional approach in its acquisition of goods and services, we deployed the survey to 6 Navy regional contracting centers and received inputs from all 6 regions, covering 66 Navy installations. In addition, we requested and received responses from Naval Supply and Naval Medical Logistics Command. Thus, our response rate for the Navy survey was 100 percent.

Air Force

The survey instrument was deployed to 50 Air Force Contracting Squadrons, representing 6 Air Force major commands. There were 34 responses from the survey, resulting in a 68 percent response rate. These responses represented all 6 Air Force major commands.

The survey began with questions that focused on specific demographic data, followed by specific questions related to the approach, method, and procedures used in the acquisition of services for specific categories of services. The categories of services targeted in this research were (a) professional, administrative, and management support; (b) maintenance and repair of equipment; (c) data processing and telecommunications; (d) utilities and housekeeping; and (e) transportation and travel. These categories were selected because collectively they represent a significant percentage of spending for all the services, and are commonly acquired in the Army, Navy, and Air Force.

The survey instrument included core questions related to the methods and procedures used in the acquisition of services for the service categories mentioned in the preceding paragraph. These core questions focused on the following areas:

Contract Characteristics

The purpose of this category of questions was to gain insight into the dominant procurement methods and contract types used in the acquisition of services. The contract characteristics examined in this section were degree of competition (competitively bid or sole source), contract type (fixed price or cost type), and type of contract incentive (incentive fee, award fee, or award term).

Acquisition Management Methods

The purpose of this broad category of questions was to understand the management methods and approaches used in the acquisition of individual services at each phase of the contract management process. For each of the contract management phases, the survey questioned whether the phase was conducted at a regional, installation, or some other organizational level. This core question category also focused on whether a project-team approach was typically used in the acquisition of the respective service category. The questions explored the position of

the services acquisition project team leader, such as a program/project manager or contracting officer. The questions also explored information on the owner of the requirement for the service being acquired.

Other Program Management Issues

This last category of core questions focused on the use of a life-cycle approach, the length of assignments for services acquisition management personnel, the use of market research techniques, the level of staffing in services acquisition management, and the level of training of services acquisition management personnel. These questions offered respondents a Likert-type scale to measure the level of agreement or disagreement among the respondents' statements.

Analysis and Comparison of Survey Data

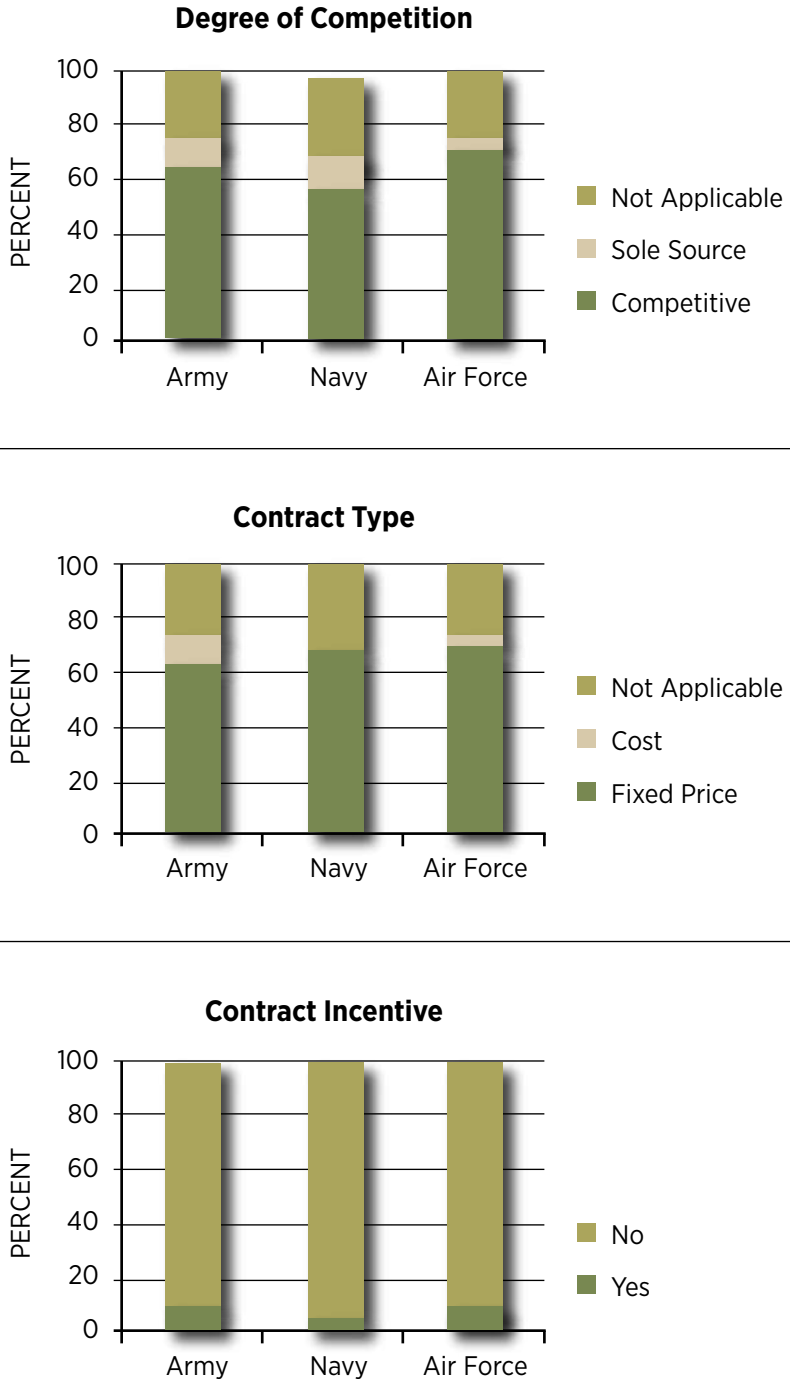
In this section, we present the results of our analysis of survey data (Appendix) concerning the acquisition management practices in the Army, Navy, and Air Force, arranged into the data categories described in the Research Methodology and the Empirical Studies section.

Contract Characteristics

We discuss three aspects of contract characteristics: degree of competition, type of contract, and contract incentives. It should be noted that the Navy and the Air Force surveys were conducted in 2008, while the Army survey was conducted in 2009. Consequently, the Army survey results contain data for 2008, while the data streams for the Navy and the Air Force surveys end in 2007. We used the contract characteristic data for 2007 and computed averages across services and acquisition phases to obtain measures of contract characteristics. The comparison of contract characteristics for the Army, Navy, and Air Force is depicted in Figure 2.

Degree of competition. Providing for full and open competition is a public policy and statutory requirement in government contracting. Unless the government can justify an exception to the competition requirements, the procurement must provide for full and open competition in the solicitation and award of the contract. In addition to supporting accountability and transparency in government contracts,

FIGURE 2. CONTRACT CHARACTERISTICS



competitive procurements also result in competitively priced proposals that increase the government's ability to negotiate a fair and reasonable contract price.

As we note at the top of Figure 2, the predominant procurement approach used in the services we studied was full and open competition. Since these services—administrative, maintenance, data processing, utilities/housekeeping, and transportation services—are traditional and commercial in nature, a valid assumption is that the competitive marketplace should be capable of proposing and competing for these contracts. However, we also note that a small but notable portion of contracts for Navy and Army were sole sourced. We do not have detailed data on these sole-sourced contracts, but perhaps the services acquired were context-specific and unique in nature.

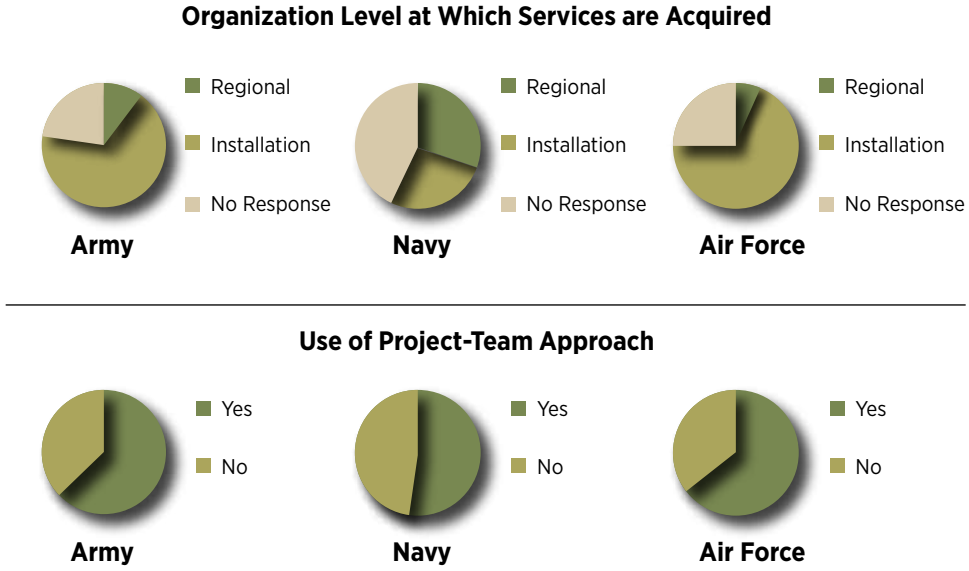
Contract type. The Federal Acquisition Regulation categorizes the major contract types as fixed-price and cost reimbursement. Fixed-price contracts are appropriate for well-defined requirements in situations with a low performance risk. On the other hand, under cost-reimbursement contracts, which are appropriate for developmental requirements, the performance risk is high. Given the commercial and low-risk nature of the services being studied, firm-fixed price contracts would be the appropriate contractual instrument for these service projects. We note in the center of Figure 2 that, as expected, a significant majority of the contracts were fixed price.

Contract incentive. In some situations, the government may want to subjectively incentivize the contractor to meet higher levels of performance and go beyond the basic requirements of the contract. In these situations, award-fee or award-term contract incentives may be used. Since commercial services are usually well understood and the output or outcome can be reasonably well defined, less contract incentives may be needed. This observation is reflected at the bottom of Figure 2.

Acquisition Management Methods

In this section, we provide a comparison of Army, Navy, and Air Force practices in two areas: the organization level at which services are acquired and the use of a project-team approach. The comparison is shown in Figure 3.

FIGURE 3. ACQUISITION MANAGEMENT METHODS



Organizational level at which services are acquired. The military departments procure services and manage services acquisition at the installation level or regional level. The proximity of locations where the acquisition contracts are managed and where the services are actually performed may have an impact on the effectiveness of the project management, as well as the success of the services projects. Services performed at one location, with the contract and overall project managed at a distant location, may result in less-than-adequate management and control of the project as well as less-than-proper surveillance of the service contractor. Insufficient control of the project and less-than-adequate surveillance of the service contractor increase the risk to the DoD of not receiving the full value of its service procurement dollars.

However, in general, it is not possible to say if acquiring services using one specific approach—regional-level or installation-level—is necessarily better than the other approach. The regional approach (centralized procurement) can give rise to economies of scale, uniformity of procedures, and the possibility of consistently using best acquisition practices. On the other hand, installation-level acquisition (decentralized procurement) allows for easier implementation of project management and program

management approaches, including accurate requirements definition and proper contractor surveillance. Under either approach, however, a key to success is adopting suitable management practices.

We note in the top row of Figure 3 that services acquisition in the Navy takes place predominantly at the regional level, whereas services acquisition in the Army and the Air Force occurs predominantly at the installation level. As we discuss later in this section and the next, this difference in approaches has a significant influence on effectiveness of various management practices such as the use of the project-team approach and the position of the person who provides the contractor surveillance.

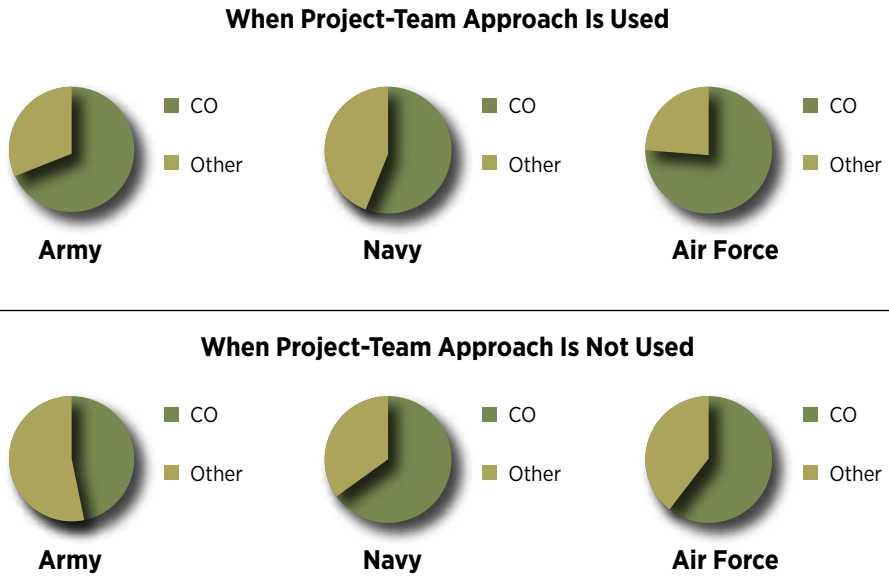
Project-team approach. Services acquisition, such as information technology services or aircraft maintenance services, is typically technically complex and requires support from various functional areas such as engineering, procurement, finance, and logistics. Best practices in project and contract management reflect the use of project teams—specifically cross-functional teams—in the management of services projects. The use of project teams facilitates the proper integration and control of the various functional disciplines involved in the project effort. Insufficient control and functional integration of project activities increase the risk of not achieving the project's cost, schedule, and performance objectives.

We note in the bottom row of Figure 3 that the Army and Air Force use the project-team approach more frequently than the Navy, which uses it slightly more than 50 percent of the time. A plausible explanation is that, in general, when services are acquired at the installation level, the physical proximity of personnel can make it easier to establish and use project teams in managing the acquisition. Thus, the use of the regional approach by the Navy means that it has less opportunity to use project teams. Perhaps a virtual-team approach may need to be adopted by the Navy.

Acquisition leadership. In addition to the use of project teams, another best practice is formally designating a trained project manager with the authority to lead the project effort. The project manager is typically a coordinator and integrator of the various functional disciplines involved in the project and has overall responsibility for the project's success. The project manager is focused on the overall objectives

of the project, and on integrating and balancing the interests of the various functional disciplines (engineering, procurement, finance, and logistics) involved in the services project. Figure 4 provides answers to the question: Who leads the services acquisition project—a contracting officer (CO) or quality assurance evaluator (QAE)/contracting officer representative (COR)? The top row of Figure 4 shows that when a project team is used, the CO predominantly leads the services acquisition project in the Army and Air Force and leads it only slightly more than half of the time in the Navy. The bottom row of Figure 4 also shows that when a project team is not used, the CO predominantly leads the services acquisition project in the Air Force and Navy and leads it only slightly less than half of the time in the Army.

FIGURE 4. ACQUISITION LEADERSHIP

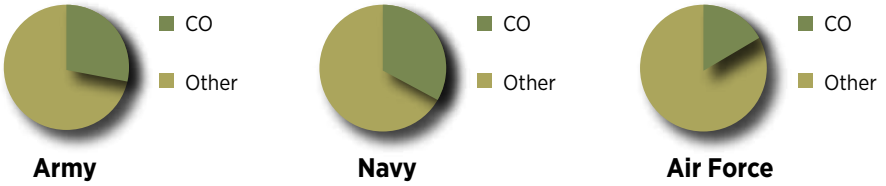


Requirement ownership. Services acquisition includes managing the requirement. The requirement is the specific service that is being procured—for example, information technology services or aircraft maintenance services. Notably, the contract management process and, more specifically, the authorities and responsibilities of the CO, do not include requirements management activities (such as determining the requirement, modifying the requirement, assessing the effectiveness of

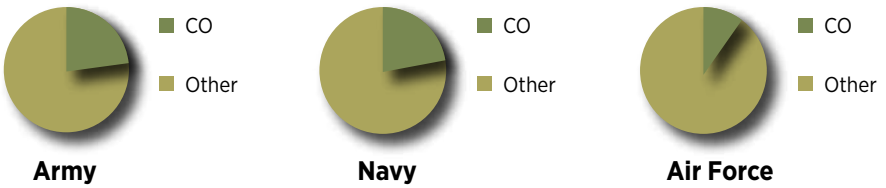
the requirement, or terminating the need for the requirement). These requirements management authorities and activities belong to the requirements manager of the organization responsible for the service being procured. Once the requirements organization identifies, develops, and defines the requirement, the contracting organization performs the contracting activities to procure the needed service. COs, however, may support the development of the requirements documents by providing business and procurement expertise in this area. For example, an aircraft maintenance squadron would own the aircraft maintenance service requirement being procured by the contracting organization for that specific installation. Figure 5 provides data on who owns the requirements—the CO or QAE/COR.

FIGURE 5. REQUIREMENTS OWNERSHIP

When Project-Team Approach Is Used



When Project-Team Approach Is Not Used



In general, the practice of having a CO lead the acquisition or own the requirements is not appropriate, regardless of whether a project-team approach is used. What is surprising from the survey data shown in Figure 4 is that the project teams are frequently led by the CO as opposed to being led by a formally designated project manager responsible for the overall service project's success. We consider this finding surprising since the CO is a functional specialist concerned with ensuring

that the contractor is in compliance with the government contracting rules, while a project manager is concerned with the overall success of the project, in terms of cost, schedule, and performance objectives. In addition, a project manager typically represents the service requirement owner and is typically responsible for making technical changes to the requirement during contract performance. This does not mean that the project manager can make changes to the contract. Only authorized COs can make changes to the contract. However, COs should not be making technical changes to the service requirement and, traditionally, do not have the expertise or technical knowledge to make such changes (for example, making technical changes to the requirements for aircraft maintenance service). The role of leading project teams involves managing the requirement and authorizing related technical changes to the requirement during contractor performance. We also observed the following in Figures 4 and 5:

- As seen in Figure 4, for the Army and Air Force the use of a project team increased the probability of the CO leading the services acquisition.

- As seen in Figure 4, for the Navy, perhaps due to regional organization, the use of project teams decreased the probability of the CO leading the acquisition.

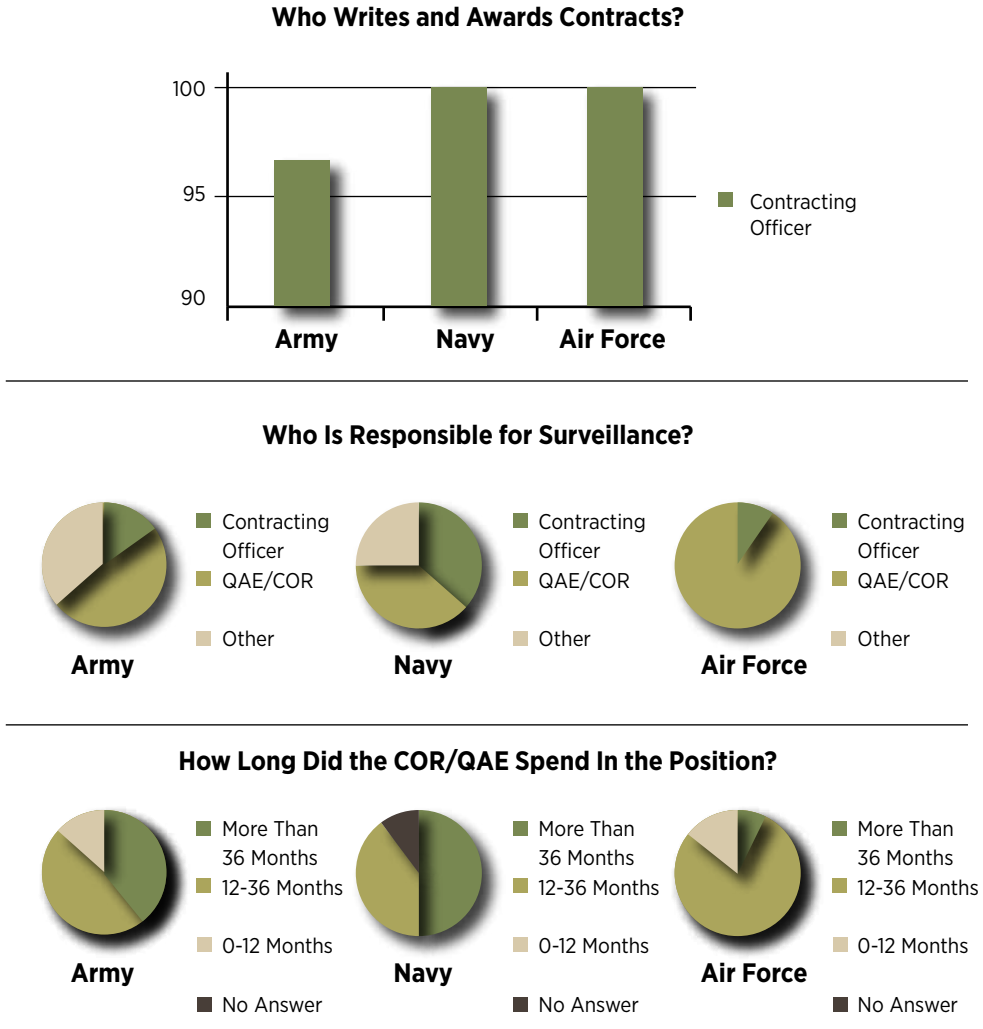
- The above two trends are also observed in Figure 5 for the requirements ownership.

Program Management Issues

The first set of program management issues we investigated was the scope and ability of personnel responsible for services acquisition. Figure 6 provides comparative data on this count.

We note in the top row of Figure 6 that, as expected, the CO always writes and awards contracts in the Navy and the Air Force. In the Army, the CO only writes and awards the contracts in 97 percent of cases. It is unclear why this is the case. One should ask who else, besides the CO, is writing and awarding contracts. It should be noted that, in accordance with the Federal Acquisition Regulation, only duly warranted COs have the authority to enter into, administer, or terminate contracts. It is unclear why the Army data would reflect that the CO awards contracts less than 100 percent of the time.

FIGURE 6. SCOPE AND ABILITY OF PERSONNEL RESPONSIBLE FOR ACQUISITION



Note. The Y Axis in the top row begins at 90 percent.

Another critical aspect of services acquisition is contractor surveillance. Contractor surveillance ensures that the contractor's performance complies with the requirements of the contract and, thus, the government is receiving the services procured. Due to the technical nature of many services contracts, contractor surveillance personnel should be knowl-

edgeable about the technical aspects of the service and be ideally drawn from the technical community responsible for the service requirement. Thus, it is critical that surveillance personal have the requisite technical skills for conducting contractor surveillance.

We note in the middle row of Figure 6 that, as expected, in the Air Force and the Army, QAE/CORs predominantly provide contractor surveillance. However, in the Navy, QAE/CORs provide contractor surveillance in about 50 percent of the cases, with the CO shouldering that responsibility in the remaining cases. These results indicate another situation in which COs may be performing activities outside their area of expertise—in this case, performing contractor surveillance. Contractor surveillance involves technical knowledge and expertise in the service requirements area. A CO, considered a business advisor with expertise in government contracting rules and regulations, should not be performing technical contractor surveillance on, for example, an aircraft maintenance service contract. Perhaps this is related to and caused by the regional approach to services acquisition being adopted by the Navy.

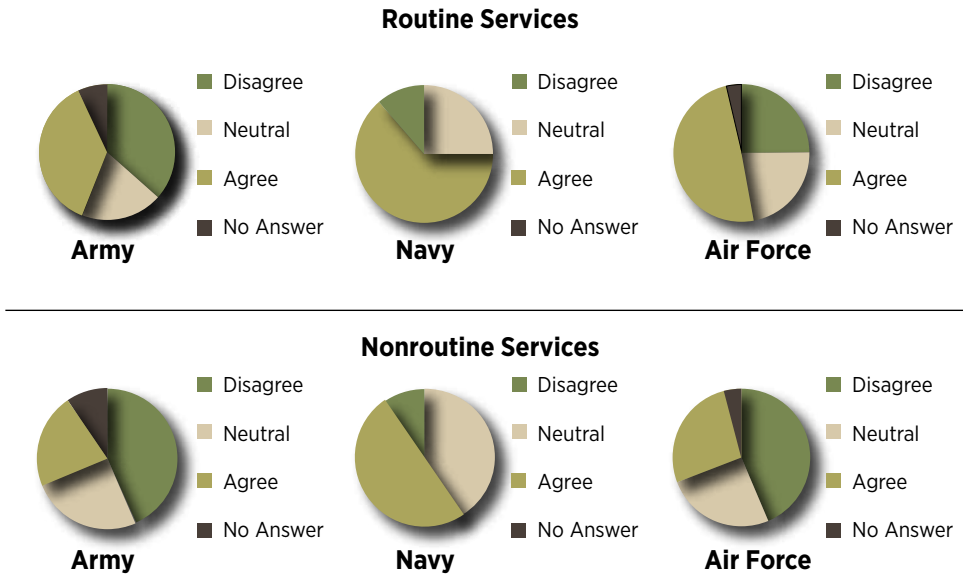
Finally, we studied the length of time COR/QAEs spend in their assigned position. The comparative data are presented in the bottom row of Figure 6. We note the following:

- The majority of COR/QAEs in the Air Force were assigned in the position for less than 3 years. Perhaps this is caused by significant turnover in staff.

- In the Navy, a significant percentage of COR/QAEs were in the job for more than 3 years. Interestingly, this seems to be the case in spite of the fact observed earlier that the CO is responsible for surveillance half of the time.

The final category of survey data consisted of other miscellaneous issues related to services acquisition program management. These include the use of the life-cycle approach in routine and nonroutine services, the adequacy of services acquisition billets, responsibility of various staff members, and the training given to these staff members. The comparative data are presented in Figures 7 and 8.

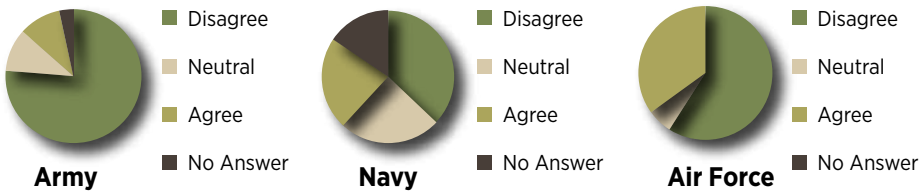
FIGURE 7. LIFE-CYCLE APPROACH



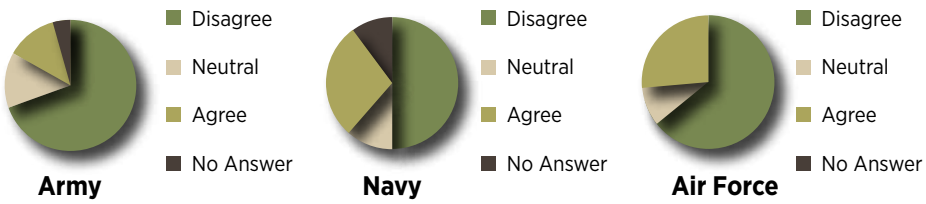
Life-cycle approach. The use of a life cycle to manage and control the progress of a project is considered a best practice in project management (Rendon & Snider, 2008). The project life cycle allows the project to be managed in phases, with each phase controlled by gates and decision points. The use of a project life cycle should be a concern for ensuring proper management of service projects, especially nonroutine services. If the services being procured and managed are of a nonroutine nature, one would expect higher levels of uncertainty—and, thus, higher levels of cost, schedule, and performance risk—in the management of these service projects. Best practices in reducing project risk include the use of a project life cycle—with project phases, gates, and decision-points for monitoring and controlling the progression of the service project procurement process as well as the resulting service. Without the use of a project life cycle, the service project may be vulnerable to excessive risk in terms of meeting cost, schedule, and performance objectives. This would especially be true in the procurement and management of high-risk nonroutine services.The top row of Figure 7 reflects that, for routine services, a life cycle was predominantly used by the Air Force, and less so (approximately less than half of the time) by the Army and Navy. As

FIGURE 8. ACQUISITION BILLETS

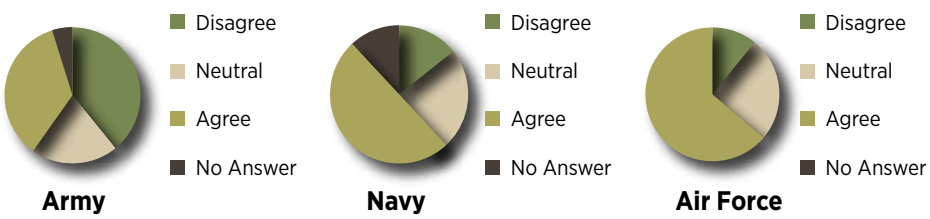
Number of Billets Is Adequate



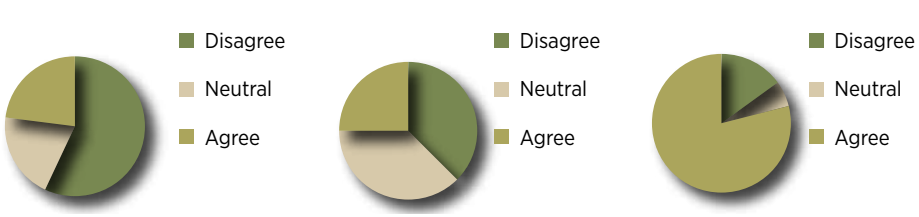
Billets Are Adequately Filled



Staff Is Adequately Trained



Proper Level of Oversight Is Afforded to Monitor Contractor Performance



seen in the bottom row of Figure 7, a life-cycle approach was predominantly used for nonroutine services by the Navy, and less so (approximately less than half of the time) by the Army and Air Force.

Service acquisition billets and responsibility of staff members. The management of services acquisition is the responsibility of the services' acquisition personnel located at the regional or installation organizations. Each acquisition organization has designated acquisition positions, or billets, for its acquisition personnel. In addition, these positions may or may not be filled due to lack of personnel (perhaps personnel are deployed) or to the understaffing of organizations. These acquisition personnel are also required to receive the appropriate training reflective of their assigned acquisition duties, such as CO, QAE, or COR. Thus, having an adequate number of acquisition billets in an organization is not sufficient. These billets must be adequately filled, and the personnel filling these acquisition billets must be adequately trained. Having an adequate number of filled acquisition billets, staffed with trained acquisition personnel, is integral to providing a proper level of oversight for monitoring contractor performance. Finally, having a proper level of oversight is critically important for successful services acquisition management.

The pie-charts in Figure 8 display the survey responses for these areas. The following are salient observations on the charts:

- The top row of Figure 8 shows that the Army and Air Force predominantly disagree that there is an adequate number of acquisition billets, while the Navy survey responses were inconclusive.

- The second row of Figure 8 reveals that the Army, Navy, and Air Force all predominantly disagree that these acquisition billets are adequately filled.

- The third row of Figure 8 indicates that the Navy and Air Force predominantly agree that the services' acquisition personnel are adequately trained, while the Army survey responses were inconclusive.

- The bottom row of Figure 8 suggests that the Army predominantly disagrees that a proper level of oversight is afforded to monitor the contractor's performance; the Air Force predominantly agrees that a proper level of oversight is afforded to monitor contractor performance; and the Navy survey responses were inconclusive.

Recommendations

To improve the management of services acquisition, our first recommendation is to continue the use of fixed-price contracts, while also increasing the number of competitively awarded contracts. Fixed-price contracts promote competition, which ensures that the government gets the right services at the best value. Fixed-price contracts also shift the risk of cost overruns away from the government and onto the contractor. This also serves to incentivize the contractor to complete tasks within budget. Also included in this first recommendation is to increase emphasis on promoting full and open competition. However, it should be noted that the initiative promoted by the current Under Secretary of Defense for Acquisition, Technology and Logistics of decreasing service contracts' total period of performance from 5 years (basic plus four options) to 3 years (basic plus two options) as an approach to increasing competition may also result in some unintended consequences. Increasing the frequency of service contracts re-competition may result in

potential offerors deciding not to submit proposals for these shorter term contracts. In addition, the incumbent contractors on services contracts may be reluctant to implement continuous improvement programs given the shorter term contracts. Hence, instead of reducing contract periods of performance, another approach to increasing competition may be to take an in-depth look at the current justifications and approvals for not providing for full and open competition.

Our second recommendation relates to the management of services acquisition at the regional versus installation level. As previously discussed, each individual approach has advantages and disadvantages. In our view, the key to success under either approach is to use the proper supporting project management processes such as requirements management, designating project managers and project teams with established roles and responsibilities, and ensuring sufficient COR surveillance of contractor performance. Consequently, we recommend that the Navy adopt a more disciplined and rigorous project management approach to its management of services acquisition, possibly including a virtual project management team. This team would consist of the project manager, requirements manager, and CO at the regional office. The QAE/COR would then serve as the site manager and be responsible for contractor surveillance. The QAE/COR would act as the "eyes and ears" of the regional project manager and CO, and would coordinate program and contracting issues back to the project manager. This might require QAEs/CORs who have higher level knowledge and skills due to their expanded roles and responsibilities. The Army and Air Force's installation-level management of services acquisition should ensure consistency in services acquisition management processes department-wide. Our recommendations include the establishment of dedicated installation project managers responsible for the overall cost, schedule, and performance requirements of the services acquisition. Additionally, the installation project teams should include a requirements manager or representative who is authorized to identify, manage, and change the services requirement and submit those technical changes to the CO for incorporating into the contract. Establishing a dedicated project manager and adding a requirements manager/representative to the project team would relieve the CO from performing these conflicting roles.

Our third recommendation to improve the overall management of services acquisition is to increase the fill-rate of current acquisition billets. Over 75 percent of the respondents disagreed that the acquisi-

tion billets were adequately filled. Thus, the initial effort in increasing the Defense Acquisition Workforce should be to first fill the current acquisition billets throughout the DoD with trained and experienced personnel. Only then will the DoD be able to determine if additional acquisition billets are needed. Additionally, special emphasis should be placed on ensuring sufficient CORs/QAEs are assigned to oversee contractors' performance. Ensuring the acquisition billets are filled with properly trained and experienced acquisition personnel will allow for better oversight and will help ensure that contractor performance is properly monitored.

Our fourth recommendation is to increase the effectiveness and availability of training to ensure a qualified Defense Acquisition Workforce. Based on the results from the research, a majority of the Army respondents, and almost half of the Air Force and Navy respondents, did not agree that the Defense Acquisition Workforce was adequately trained. Respondents also provided numerous negative comments regarding the poor quality of training and the lack of training. Our recommendation is not necessarily that additional training is needed, but that more appropriate training is needed. This needed training may be in the form of experiential or on-the-job training, and localized coaching and mentoring in contracting procedures, as opposed to additional formal Defense Acquisition University classroom training. For example, current research by students enrolled in the Naval Postgraduate School MBA Contract Management program has identified that a knowledge gap exists within the Air Force contracting workforce. Based on a limited empirical survey sample of the Air Force contracting workforce, this knowledge gap reflects that the Air Force contracting workforce receives more formalized classroom training on contracting activities that are less frequently performed, and less formal classroom training related to contracting activities that are performed more frequently. Additionally, and more importantly, if the COs are to continue acting as de-facto project managers by leading the acquisition teams, then they should receive training on project management concepts, project control techniques, and project leadership.

Finally, as discussed earlier, the researchers in the fields of operations management have studied and identified several key characteristics of services that lead to differences in the production of services as opposed to manufactured products. We believe that the same key characteristics must also be taken into account in designing and managing the

processes involved in acquiring services. Given these considerations, we believe that significant opportunities exist to conduct research into the impact of these services' characteristics (intangibility, co-production, simultaneity of production and consumption, inability to store services, and complexity in defining and measuring services) on the acquisition of different service types and the associated implications for the services acquisition management process.

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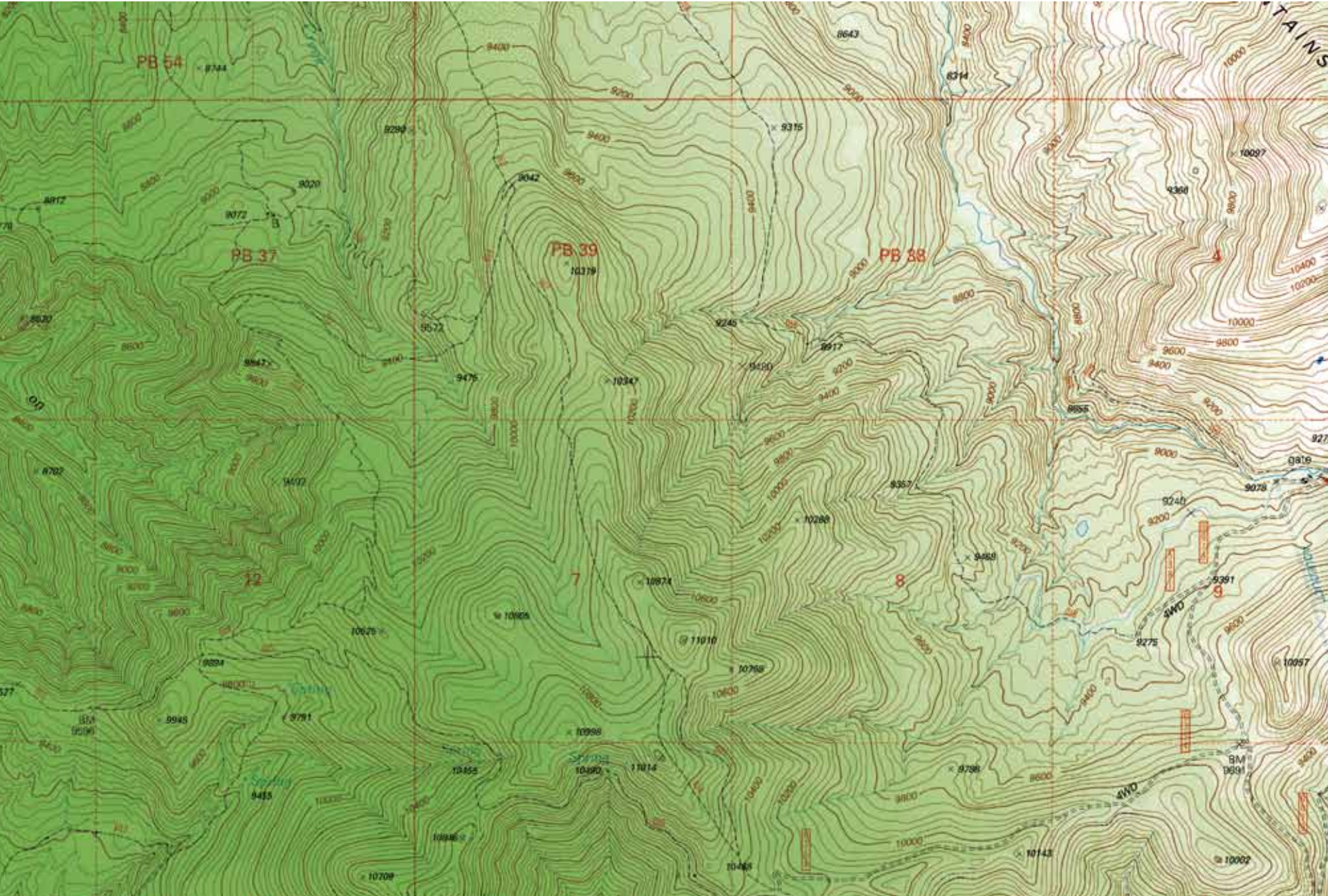
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Appendix

TABLE 1. DEFICIENCIES IN SERVICES CONTRACTING

• The government is required to conduct market research to determine the market's capability for providing the required supply or services and the government's appropriate contracting strategy for the procurement (Rendon & Snider, 2008). Reports have shown that the DoD has not conducted adequate market research during procurement planning of services contracts (GAO, 2002a; DoD IG, 2009).
• Selecting the appropriate contract type is essential to ensuring the appropriate sharing and allocation of risk between the government and the contractor. Fixed-price contracts allocate the majority of the cost risk to the contractor, while cost-reimbursement contracts provide for most of the cost risk to be borne by the government. Government reports have shown that inappropriate contract types were used in services contracts, resulting in more risk to the government (GAO, 2001; DoD IG, 2009).
• The use of project management tools and techniques, such as designated formal project managers, project teams, and project life cycles, have been considered a best practice in managing services contracts. GAO reports have shown that the DoD lacks the proper management structure and processes for managing services contracts (GAO, 2007b; DoD IG, 2009).
• Sufficient requirements management is essential for identification and development of needs for the DoD. If requirements management is insufficient, the resulting services contracts will not adequately meet the customer's needs. The GAO and DoD IG reports have identified poorly defined requirements and insufficient requirements management as problems in services contracts (GAO, 2007b; DoD IG, 2009).
• Defense contract management requires specialized skills and competencies that come from extensive training and experience. A properly trained and competent Defense Acquisition Workforce is considered the heart of successful defense acquisition management. With the downsizing of the DoD workforce, the lack of a qualified acquisition and contracting workforce to manage the increased workload in DoD services contracts continues to plague DoD services contracting efforts (GAO, 2002b; 2009b).
• The essence of DoD contract management is the proper administration of contracts and oversight of contractor performance. The lack of effective contract administration and contractor oversight increases the government's risk of not ensuring total value for the dollars spent on services contracts. The GAO and DoD IG reports have consistently identified contract administration and contractor oversight as problem areas in the management of services contracts (GAO, 2005; 2007a; 2007b; DoD IG, 2009).

TABLE 2. COMPARISON OF MANAGEMENT PRACTICES IN THE ARMY, NAVY AND AIR FORCE
(ALL NUMBERS ARE IN PERCENTAGES)

	ARMY	NAVY	AIR FORCE
CONTRACT CHARACTERISTICS (Figure 2)			
Degree of Competition			
Competitive	66	56	71
Sole Source	10	13	4
Not Applicable	24	28	25
Contract Type			
Fixed Price	66	69	71
Cost Reimbursement	8	0	4
Not Applicable	26	31	25
Contract Incentive			
Yes	9	5	8
No	91	95	92
ACQUISITION MANAGEMENT METHODS (Figure 3)			
Organization Level at Which Services are Acquired			
Regional	11	32	5
Installation	66	24	70
No Response	23	44	25
Use of Project-Team Approach			
Yes	63	51	64
No	38	49	36
ACQUISITION LEADERSHIP (Figure 4)			
When Project-Team Approach Is Used			
CO	69	56	76
Other	31	44	24
When Project-Team Approach Is Not Used			
CO	47	65	61
Other	53	35	39

	ARMY	NAVY	AIR FORCE
REQUIREMENTS OWNERSHIP (Figure 5)			
When Project-Team Approach Is Used			
CO	28	33	17
Other	72	67	83
When Project-Team Approach Is Not Used			
CO	22	24	10
Other	78	76	90
SCOPE AND ABILITY OF PERSONNEL RESPONSIBLE FOR ACQUISITION (Figure 6)			
Who Writes and Awards Contracts?			
CO	97	100	100
Other	3	0	0
Who Is Responsible for Surveillance?			
CO	13	38	9
QAE/COR	51	38	91
Other	36	25	0
How Long Did the COR/QAE Spend in the Position?			
more than 36 months	39	50	6
12-36 months	48	38	79
0-12 months	13	0	15
No Answer	0	12	0

	ARMY	NAVY	AIR FORCE
LIFE-CYCLE APPROACH (Figure 7)			
Routine Services			
Disagree	34	0	26
Neutral	18	25	21
Agree	41	63	50
No Answer	7	12	3
Nonroutine Services			
Disagree	43	0	41
Neutral	25	38	26
Agree	21	50	29
No Answer	11	12	4
ACQUISITION BILLETS (Figure 8)			
Number of Billets Is Adequate			
Disagree	74	38	59
Neutral	10	25	6
Agree	13	25	35
No Answer	3	12	0
Billets are Filled			
Disagree	66	50	65
Neutral	13	13	9
Agree	17	25	26
No Answer	5	12	0
Staff Is Adequately Trained			
Disagree	38	13	9
Neutral	20	25	21
Agree	39	50	71
No Answer	3	12	0
Proper Level of Oversight Is Afforded to Monitor Contractor Performance			
Disagree	57	38	15
Neutral	20	38	6
Agree	23	25	79